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RAW SEQUENCE LISTING
 PATENT APPLICATION: US/09/105,117K

DATE: 03/04/2003
 TIME: 15:37:48

Input Set : A:\Seq_listing_US_korrigiert130203.txt
 Output Set: N:\CRF4\03042003\I105117K.raw

3 <110> APPLICANT: Forschungszentrum Juelich GmbH; Marina Vrlijc et al.
 5 <120> TITLE OF INVENTION: Process for the microbial production of amino acids by
 6 boosted activity of export carriers
 8 <130> FILE REFERENCE: 1
 10 <140> CURRENT APPLICATION NUMBER: US/09/105,117K
 11 <141> CURRENT FILING DATE: 1998-06-17
 12 <150> PRIOR APPLICATION NUMBER: PCT/DE96/02485
 13 <151> PRIOR FILING DATE: 1996-12-18
W--> 14 <160> NUMBER OF SEQ ID: 5
 16 <170> SOFTWARE: PatentIn Ver. 2.0
 18 <210> SEQ ID NO: 1
 19 <211> LENGTH: 2374
 20 <212> TYPE: DNA
 21 <213> ORGANISM: Corynebacterium glutamicum
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 23 <221> NAME/KEY: gene
 24 <222> LOCATION: CDS (1016)..(1726)
 25 <223> OTHER INFORMATION: (LysE)
 27 <400> SEQUENCE: 1
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 30 cctgaacctt ttccagaagta actaaggccg caatccctcg attgctgcat caacgacggc 120
 32 gtcgtgtgagt cttagcttagat ccgtatccat cggccat cttttccat acatcggtgt 180
 34 gtcaatgggt atctcatcga ggaggatcac ttctcctgct tttagcatgg gagcagcttg 240
 36 ggtttcggga agaagtcccc aaccaggcc tcggcattt gcctcaccaa aaccccccgc 300
 38 cgacgggaca atggatacgc gcctgcgccc cacaggacca tcgacgcgcc cgtccaggc 360
 40 acgggtcttga agcacatctt tggaccgaa gcgtaaagacg ggcacatcgac cccaatctag 420
 42 tttcccatca accatgttagg catcccgaa tgagggggtt gcaatggcca agtggcgcat 480
 44 ggttccaagt tctactactt cacatccccg cacgggatta gcttcacggg ttaccgctcc 540
 46 taaaacatct ccacgcccga gcaaggataa tgtgtcgct tcatcttcca agcgcagcgt 600
 48 gagcgttgct ccaccccaag aagctacccg gttgaacacg ggaggaaacc atgtggatag 660
 50 cgaatctgca ttgtatggcga tggttaacgg gatttcacca aggctccag atagttgcgc 720
 52 tttagttct gcttgcagca acaccatttt ccgcgcgtct tgcacaaggaa cttcacccgc 780
 54 ttccgttgct ttggccgggtt gggtgcgcga taccaacact cgacccacgt gatgctcgag 840
 56 agctttaacg cgctgactca ccgcggagg ggaaatggaa agggctaagg aggcgccttc 900
 59 gaagctgcct tcatcaatga ttgagagcaa agtgtccagt tgaatgggt tcatgaagct 960
 61 atattaaacc atgttaagaa ccaatcattt tacttaagta cttccatagg tcacg atg 1018
 62 Met
 63 1
 65 gtg atc atg gaa atc ttc att aca ggt ctg ctt ttg ggg gcc agt ctt 1066
 66 Val Ile Met Glu Ile Phe Ile Thr Gly Leu Leu Leu Ala Ser Leu
 67 5 10 15
 69 tta ctg tcc atc gga ccg cag aat gta ctg gtg att aaa caa gga att 1114
 70 Leu Leu Ser Ile Gly Pro Gln Asn Val Leu Val Ile Lys Gln Gly Ile

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71	20	25	30	
73	aag cgc gaa gga ctc att gcg gtt ctt ctc gtg tgt tta att tct gac			1162
74	Lys Arg Glu Gly Leu Ile Ala Val Leu Leu Val Cys Leu Ile Ser Asp			
75	35	40	45	
77	gtc ttt ttg ttc atc gcc ggc acc ttg ggc gtt gat ctt ttg tcc aat			1210
78	Val Phe Leu Phe Ile Ala Gly Thr Leu Gly Val Asp Leu Leu Ser Asn			
79	50	55	60	65
81	gcc gcg ccg atc gtg ctc gat att atg cgc tgg ggt ggc atc gct tac			1258
82	Ala Ala Pro Ile Val Leu Asp Ile Met Arg Trp Gly Gly Ile Ala Tyr			
83	70	75	80	
85	ctg tta tgg ttt gcc gtc atg gca gcg aaa gac gcc atg aca aac aag			1306
86	Leu Leu Trp Phe Ala Val Met Ala Ala Lys Asp Ala Met Thr Asn Lys			
87	85	90	95	
89	gtg gaa gcg cca cag atc att gaa gaa aca gaa cca acc gtg ccc gat			1354
90	Val Glu Ala Pro Gln Ile Ile Glu Glu Thr Glu Pro Thr Val Pro Asp			
91	100	105	110	
93	gac acg cct ttg ggc ggt tcg gcg gtg gcc act gac acg cgc aac cgg			1402
94	Asp Thr Pro Leu Gly Gly Ser Ala Val Ala Thr Asp Thr Arg Asn Arg			
95	115	120	125	
97	gtg cgg gtg gag gtg agc gtc gat aag cag cgg gtt tgg gta aag ccc			1450
98	Val Arg Val Glu Val Ser Val Asp Lys Gln Arg Val Trp Val Lys Pro			
99	130	135	140	145
101	atg ttg atg gca atc gtg ctg acc tgg ttg aac ccg aat gcg tat ttg			1498
102	Met Leu Met Ala Ile Val Leu Thr Trp Leu Asn Pro Asn Ala Tyr Leu			
103	150	155	160	
105	gac gcg ttt gtg ttt atc ggc ggc gtc ggc gcg caa tac ggc gac acc			1546
106	Asp Ala Phe Val Phe Ile Gly Gly Val Gly Ala Gln Tyr Gly Asp Thr			
107	165	170	175	
109	gga cgg tgg att ttc gcc gct ggc gcg ttc gcg gca agc ctg atc tgg			1594
110	Gly Arg Trp Ile Phe Ala Ala Gly Ala Phe Ala Ala Ser Leu Ile Trp			
111	180	185	190	
113	tcc ccg ctg gtg ggt ttc ggc gca gca gca ttg tca cgc ccg ctg tcc			1642
114	Phe Pro Leu Val Gly Phe Gly Ala Ala Ala Leu Ser Arg Pro Leu Ser			
115	195	200	205	
117	agc ccc aag gtg tgg cgc tgg atc aac gtc gtc gtg gca gtt gtg atg			1690
118	Ser Pro Lys Val Trp Arg Trp Ile Asn Val Val Val Ala Val Val Met			
119	210	215	220	225
121	acc gca ttg gcc atc aaa ctg atg ttg atg ggt tag ttttgcggg			1736
122	Thr Ala Leu Ala Ile Lys Leu Met Leu Met Gly			
123	230	235		
125	ttttgaaatc ggtggcttc gccccaaatgt tgatgccggc gtcgtggaa atctcatcga			1796
127	tgcctccaa ctcggcgtca gaaaactcca agtttgttag tgaatcaagg ctgttgtcca			1856
129	gtcgctcaac tgacgaagca ccaatcaatg cactggcac ggtatccgcg ccgtactctc			1916
131	cttgctcgcg cagcacccat gcaagcgcca tctgcgcaag tgactgccc cgttcctggg			1976
133	cgtatgtcatt gagtttgcgg accatatcaa tattttcac gttcaacatg ccctcagaca			2036
135	gggacttacc ctggctggcg cgggaacctt ctggattcc atcgagatat ttgtccgtga			2096
137	gcaggccctg cgcaagtggt gagaaagcaa tgacgccaag accattgtt gcagctgact			2156
139	gcaacaagtt ctcaccgtca tcgccccgtt cctccaccca acgattaatg atgaaatagc			2216
141	ttggctgatg aatcagaagc gggcagccct cctccgccat gaactcagcc gcctccgctg			2276

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143 tgagctctgg accgttaggaa gaaataccca cgtaaagagc ctttccagac gcaacaatgt 2336

145 cacgcataatgc gtacatgggt tcttccaaag gagtatct 2374

150 <210> SEQ ID NO: 2

151 <211> LENGTH: 236

152 <212> TYPE: PRT

153 <213> ORGANISM: Corynebacterium glutamicum

W--> 154 <220> FEATURE:

155 <223> OTHER INFORMATION: (LysE)

157 <400> SEQUENCE: 2

158 Met Val Ile Met Glu Ile Phe Ile Thr Gly Leu Leu Leu Gly Ala Ser

159 1 5 10 15

161 Leu Leu Leu Ser Ile Gly Pro Gln Asn Val Leu Val Ile Lys Gln Gly

162 20 25 30

164 Ile Lys Arg Glu Gly Leu Ile Ala Val Leu Leu Val Cys Leu Ile Ser

165 35 40 45

167 Asp Val Phe Leu Phe Ile Ala Gly Thr Leu Gly Val Asp Leu Leu Ser

168 50 55 60

170 Asn Ala Ala Pro Ile Val Leu Asp Ile Met Arg Trp Gly Gly Ile Ala

171 65 70 75 80

173 Tyr Leu Leu Trp Phe Ala Val Met Ala Ala Lys Asp Ala Met Thr Asn

174 85 90 95

176 Lys Val Glu Ala Pro Gln Ile Ile Glu Glu Thr Glu Pro Thr Val Pro

177 100 105 110

179 Asp Asp Thr Pro Leu Gly Gly Ser Ala Val Ala Thr Asp Thr Arg Asn

180 115 120 125

182 Arg Val Arg Val Glu Val Ser Val Asp Lys Gln Arg Val Trp Val Lys

183 130 135 140

185 Pro Met Leu Met Ala Ile Val Leu Thr Trp Leu Asn Pro Asn Ala Tyr

186 145 150 155 160

188 Leu Asp Ala Phe Val Phe Ile Gly Gly Val Gly Ala Gln Tyr Gly Asp

189 165 170 175

191 Thr Gly Arg Trp Ile Phe Ala Ala Gly Ala Phe Ala Ala Ser Leu Ile

192 180 185 190

194 Trp Phe Pro Leu Val Gly Phe Gly Ala Ala Ala Leu Ser Arg Pro Leu

195 195 200 205

197 Ser Ser Pro Lys Val Trp Arg Trp Ile Asn Val Val Val Ala Val Val

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201 225 230 235

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208 <211> LENGTH: 2374

209 <212> TYPE: DNA

210 <213> ORGANISM: Corynebacterium glutamicum

W--> 211 <220> FEATURE:

212 <221> NAME/KEY: unsure

213 <222> LOCATION: CDS (2)..(652)

214 <223> OTHER INFORMATION: orf3

215 (complement to SEQ ID No. 1)

W--> 216 <220> FEATURE:

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217 <221> NAME/KEY: gene
 218 <222> LOCATION: CDS (1421)..(2293)
 219 <223> OTHER INFORMATION: LysG
 221 <400> SEQUENCE: 3

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 223 Asp Thr Pro Leu Glu Glu Thr Met Tyr Ala Leu Arg Asp Ile Val Ala
 224 1 5 10 15
 226 tct gga aag gct ctt tac gtg ggt att tct tcc tac ggt cca gag ctc 97
 227 Ser Gly Lys Ala Leu Tyr Val Gly Ile Ser Ser Tyr Gly Pro Glu Leu
 228 20 25 30
 230 aca gcg gag gcg gct gag ttc atg gcg gag gag ggc tgc ccg ctt ctg 145
 231 Thr Ala Glu Ala Ala Glu Phe Met Ala Glu Glu Gly Cys Pro Leu Leu
 232 35 40 45
 234 att cat cag cca agc tat tcc atc att aat cgt tgg gtg gag gaa ccg 193
 235 Ile His Gln Pro Ser Tyr Ser Ile Ile Asn Arg Trp Val Glu Glu Pro
 236 50 55 60
 238 ggc gat gac ggt gag aac ttg ttg cag tca gct gcc aac aat ggt ctt 241
 239 Gly Asp Asp Gly Glu Asn Leu Leu Gln Ser Ala Ala Asn Asn Gly Leu
 240 65 70 75 80
 242 ggc gtc att gct ttc tca cca ctt gcg cag ggc ctg ctc acg gac aaa 289
 243 Gly Val Ile Ala Phe Ser Pro Leu Ala Gln Gly Leu Leu Thr Asp Lys
 244 85 90 95
 246 tat ctc gat gga att cca gag ggt tcc cgc gcc agc cag ggt aag tcc 337
 247 Tyr Leu Asp Gly Ile Pro Glu Gly Ser Arg Ala Ser Gln Gly Lys Ser
 248 100 105 110
 250 ctg tct gag ggc atg ttg aac gtg aac aat att gat atg gtc cgc aag 385
 251 Leu Ser Glu Gly Met Leu Asn Val Asn Asn Ile Asp Met Val Arg Lys
 252 115 120 125
 254 ctc aat gac atc gcc cag gaa cgc ggg cag tca ctt gcg cag atg gcg 433
 255 Leu Asn Asp Ile Ala Gln Glu Arg Gly Gln Ser Leu Ala Gln Met Ala
 256 130 135 140
 258 ctt gca tgg gtg ctg cgc gag caa gga gag tac ggc gcg gat acc gtg 481
 259 Leu Ala Trp Val Leu Arg Glu Gln Gly Glu Tyr Gly Ala Asp Thr Val
 260 145 150 155 160
 262 acc agt gca ttg att ggt gct tcg tca gtt gag cag ctg gac aac agc 529
 263 Thr Ser Ala Leu Ile Gly Ala Ser Ser Val Glu Gln Leu Asp Asn Ser
 264 165 170 175
 266 ctt gat tca ctc aac aac ttg gag ttt tct gac gcc gag ttg gag gcg 577
 267 Leu Asp Ser Leu Asn Asn Leu Glu Phe Ser Asp Ala Glu Leu Glu Ala
 268 180 185 190
 270 atc gat gag att tcc cac gac gcc ggc atc aac att tgg gcg aag gcc 625
 271 Ile Asp Glu Ile Ser His Asp Ala Gly Ile Asn Ile Trp Ala Lys Ala
 272 195 200 205
 274 acc gat tcc aaa acc cgc gaa aac taa cccatcaaca tcagtttgat 672
 275 Thr Asp Ser Lys Thr Arg Glu Asn
 276 210 215
 278 ggccaatgcg gtcatcacaa ctgccacgac gacgttgate cagcgccaca ccttgggct 732
 280 ggacagcggg cgtgacaatg ctgctgcgcc gaaacccacc agcgggaacc agatcaggct 792
 282 tgccgcgaac gcccacgccc cgaaaatcca ccgtccgggtg tcgcccgtatt gcgccgcgac 852

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284	gccggccata	aacacaaacg	cgtccaaata	cgcattcggg	ttcaaccagg	tcagcacat	912			
286	tgc	ccatcaac	atgggctta	cccaaaccg	ctgcttatcg	acgctcacct	972			
288	ccgg	ttgcgc	gtgtcagtgg	ccaccgcccga	accgccccaa	ggcgtgtcat	1032			
290	tgg	ttctgtt	tcttcaatga	tctgtggcgc	ttccacctt	tttgtcatgg	1092			
292	tgc	ccatgacg	gcaaaaccata	acaggtaa	gatgccaccc	cagcgcataa	1152			
294	gatcggcgc	gcattggaca	aaagatcaac	gcccaagg	tgccgatga	acaaaaagac	1212			
296	gtc	cagaattt	aaacacacga	gaagaaccgc	aatgagtct	tcgcgttta	1272			
298	aatcacc	acattctgcg	gtccgatgga	cagtaaaaga	ctggccccc	aaagcagacc	1332			
300	tgtaatgaag	atttccatga	tcaccatcg	gacctatgga	agtaacttaag	taaaatgatt	1392			
302	ggttcttaac	atggttaat	atagcttc	atg aac ccc	att caa ctg gac	act	1444			
303					Met Asn Pro Ile Gln Leu Asp Thr					
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306	ttg	ctc tca	atc att	gat gaa	ggc agc	ttc gaa	ggc gcc tcc tta	1492		
307	Leu	Leu Ser	Ile Ile	Asp Glu	Gly Ser	Phe	Glu Gly Ala Ser	Leu Ala		
W--> 308		230		235		240				
310	ctt	tcc att	tcc ccc	tcg gcg	gtg agt	cag cgc	gtt aaa	gct ctc gag	1540	
311	Leu	Ser Ile	Ser Pro	Gly Val	Arg Ser	Gln Val	Arg Lys	Ala Leu	Glu	
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314	cat	cac gtg	ggt cga	gtg ttg	gta tcg	cgc acc	caa ccg	gcc aaa	gca	1588
315	His His	Val Gly	Arg Val	Leu Val	Ser Arg	Thr Gln	Pro Gln	Ala Lys	Ala	
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318	acc	gaa gcg	ggt gaa	gtc ctt	gtg caa	gca gcg	cg	aaa atg	gtg ttg	1636
319	Thr	Glu Ala	Gly Glu	Val Val	Gln Ala	Ala Arg	Lys Met	Val Val	Leu	
W--> 320		275		280		285				
322	ctg	caa gca	gaa act	aaa gcg	caa cta	tct gga	cgc ctt	gct gaa	atc	1684
323	Leu	Gln Ala	Glu Thr	Lys Ala	Gln Leu	Ser Gly	Arg Leu	Ala Glu	Ile	
W--> 324	290		295		300		305			
326	ccg	tta acc	atc gcc	atc aac	gca gat	tcg cta	tcc aca	tgg ttt	cct	1732
327	Pro	Leu Thr	Ile Ala	Ile Asn	Ala Asp	Ser Leu	Ser Thr	Trp Phe	Pro	
W--> 328		310		315		320				
330	ccc	gtg ttc	aac gag	gta gct	tct tgg	ggt gga	gca acg	ctc acg	ctg	1780
331	Pro	Val Phe	Asn Glu	Val Ala	Ser Trp	Gly Gly	Ala Thr	Leu Thr	Leu	
W--> 332		325		330		335				
334	cgc	ttg gaa	gat gaa	gcg cac	aca tta	tcc ttg	ctg cgg	cgt gga	gat	1828
335	Arg	Leu Glu	Asp Glu	Ala His	Thr Leu	Ser Leu	Leu Arg	Arg Gly	Asp	
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338	gtt	tta gga	gcf gta	acc cgt	gaa gct	aat ccc	gtg gcg	gga tgt	gaa	1876
339	Val	Leu Gly	Ala Val	Thr Arg	Glu Ala	Asn Pro	Val Ala	Gly Cys	Glu	
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342	gta	gta gaa	ctt gga	acc atg	cgc cac	ttg gcc	att gca	acc ccc	tca	1924
343	Val	Val Glu	Leu Gly	Thr Met	Arg His	Leu Ala	Ile Ala	Thr Pro	Ser	
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346	ttg	cgg gat	gcc tac	atg gtt	gat ggg	aaa cta	gat tgg	gct gcg	atg	1972
347	Leu	Arg Asp	Ala Tyr	Met Val	Asp Gly	Lys Leu	Asp Trp	Ala Ala	Met	
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350	ccc	gtc tta	cgc ttc	ggt ccc	aaa gat	gtg ctt	caa gac	cgt gac	ctg	2020
351	Pro	Val Leu	Arg Phe	Gly Pro	Lys Asp	Val Leu	Gln Asp	Arg Asp	Leu	
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354	gac	ggg cgc	gtc gat	ggt cct	gtg ggg	cgc agg	cgc gta	tcc att	gtc	2068

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The rules require that a line not exceed 72 characters in length. This includes spaces.

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L:364 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:3
L:368 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:3
L:372 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:3
L:376 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:3
L:387 M:283 W: Missing Blank Line separator, <220> field identifier
L:438 M:283 W: Missing Blank Line separator, <220> field identifier